

## CLAIMS

1. Use of N-acetylcysteine as reducing agent and of a laccase as oxidizing agent in oxidation dyeing in the presence of at least one oxidation dye precursor.

2. Process for dyeing keratin fibres, and in particular human keratin fibres such as the hair, characterized in that it consists:

- in applying to the fibres a dye composition (A) containing, in a medium which is suitable for dyeing, at least one oxidation dye precursor and, optionally, one or more couplers and, as reducing agent, N-acetylcysteine, and

- in developing the colour in the presence of air in alkaline, neutral or acidic medium using at least one laccase incorporated into the composition (A) or into a composition (B),

the compositions (A) and (B) being mixed together immediately before use or applied one after the other to the keratin fibres.

3. Process according to Claim 2, in which the composition (A) contains from 0.005% to 2% by weight relative to the total weight of the composition (A) of N-acetylcysteine.

4. Process according to Claim 3, in which the composition (A) contains from 0.01% to 0.25% by weight of N-acetylcysteine relative to the total weight of the composition (A).

5. Process according to any one of Claims 2 to 4, in which the laccase is chosen from laccases of plant origin, of animal origin, of fungal origin and of bacterial origin, or obtained by biotechnology.
6. Process according to any one of Claims 2 to 5, in which the laccase is chosen from those produced by plants which carry out chlorophyll synthesis.
7. Process according to Claim 6, in which the laccase is chosen from those extracted from Anacardiaceae plants or Podocarpaceae plants, from Rosmarinus off.; from Solanum tuberosum; from Iris sp.; from Coffea sp.; from Daucus carota; from Vinca minor; from Persea americana; from Catharethus roseus; from Musa sp.; from Malus pumila; from Ginkgo biloba; from Monotropa hypopithys (Indian pipe), from Aesculus sp.; from Acer pseudoplatanus; from Prunus persica and from Pistacia palaestina.
8. Process according to Claim 5, in which the laccase is chosen from those obtained from Pyricularia oryzae, from Polyporus versicolor, from Rhizoctonia praticola, from Rhus vernicifera, from Scytalidium, from Polyporus pinsitus, from Myceliophthora thermophila, from Rhizoctonia solani, from Trametes versicolor, from Fomes fomentarius, from Chaetomium thermophile, from Neurospora crassa, from Coriolus versicol, from Botrytis cinerea, from Rigidoporus lignosus, from Phellinus noxius, from Pleurotus ostreatus, from Aspergillus nidulans, from Podospore anserina, from Agaricus bisporus, from Ganoderma lucidum, from Glomerella cingulata, from Lactarius piperatus, from Russula delica, from Heterobasidion annosum, from Thelephora terrestris, from Cladosporium cladosporioides, from Cerrena unicolor,

from *Coriolus hirsutus*, from *Ceriporiopsis subvermispora*, from *Coprinus cinereus*, from *Panaeolus papilionaceus*, from *Panaeolus sphinctrinus*, from *Schizophyllum commune*, from *Dichomitius squalens*, and from variants thereof.

9. Process according to any one of Claims 2 to 8, in which the laccase is present in amounts ranging from 0.5 to 3 000 lacu, or from 1 000 to  $6 \times 10^7$  u units; or from 20 to  $3 \times 10^6$  ulac units, per 100 g of ready-to-use composition.

10. Process according to any one of Claims 2 to 9, in which the oxidation dye precursors of the composition (A) are chosen from ortho- and para-phenylenediamines, bis(phenyl)alkylenediamines, ortho- and para-aminophenols, and heterocyclic bases, and also addition salts of these compounds with an acid.

11. Process according to Claim 10, in which the oxidation dye precursors are present in a proportion of from 0.0005% to 12% by weight relative to the total weight of the composition (A).

12. Process according to any one of Claims 2 to 11, in which the couplers of the composition (A) are chosen from meta-phenylenediamines, meta-aminophenols, meta-diphenols and heterocyclic couplers, and the addition salts of these compounds with an acid.

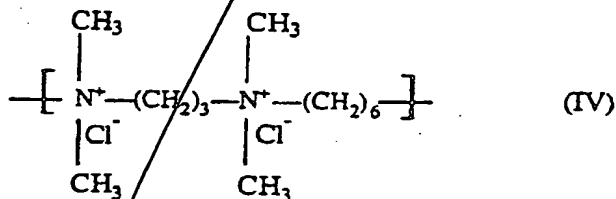
13. Process according to Claim 12, in which the couplers are present in a proportion of from 0.0001% to 10% by weight relative to the total weight of the composition (A).

14. Process according to Claims 10 and 12, in which the addition salts of the oxidation dye precursors and of the couplers with an acid are chosen from the hydrochlorides, hydrobromides, sulphates, tartrates, lactates and acetates.

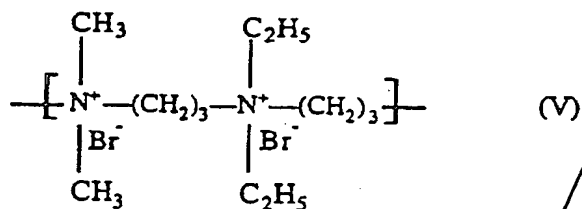
15. Process according to any one of Claims 2 to 14, in which the composition (A) also contains direct dyes.

16. Process according to any one of Claims 2 to 15, in which the composition (A) and/or (B) also contains at least one cationic or amphoteric substantive polymer.

17. Process according to Claim 16, in which the substantive polymer is a poly(quaternary ammonium) polymer consisting of repeating units corresponding to formula (IV) below:



18. Process according to Claim 16, in which the substantive polymer is a poly(quaternary ammonium) polymer consisting of repeating units corresponding to formula (V) below:



19. Process according to any one of Claims 2 to 18, in which the composition (A) also contains one or more adjuvants chosen from sequestering agents, hair conditioners, in particular silicones, preserving agents, opacifiers and anionic, nonionic or amphoteric surfactants, or mixtures thereof.
20. Process according to any one of Claims 2 to 19, in which the pH value of the ready-to-use composition is between 3 and 11, preferably between 4 and 9 and even more preferably between 6 and 8.
21. Composition (A) as defined in any one of Claims 2 to 20.
22. Ready-to-use composition which may be obtained by mixing together the compositions (A) and (B) as defined in any one of Claims 2 to 20.
23. Process for dyeing keratin fibres, and in particular human keratin fibres such as the hair, characterized in that at least one dye composition (A) with laccase according to Claim 21 or a ready-to-use dye composition according to Claim 22 is applied to the fibres for a period which is sufficient to develop the desired coloration.
24. Process, characterized in that it comprises a preliminary step which consists in separately

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$$G_{a^2}^{b^2}$$

ADD  
a3